

**SATURN'S RINGS.**—Further observations of the invisibility of Saturn's rings during the recent passage of the earth through the plane containing them are recorded in No. 4215 (p. 249, November 17) of the *Astronomische Nachrichten*. According to the calculations of Prof. B. Peter, of Leipzig, the second disappearance should have taken place on October 4. M. Schaer, of Geneva, saw the rings as a luminous line without any difficulty on October 2, using a reflector of 140 mm. aperture. On October 3 the weather was unfavourable, but the rings were still visible, with a reflector of 160 mm. aperture, at 6h. 45m. on October 4. At 7h. 30m., however, the last trace of the bright line had disappeared. Continuing the observations with a refractor of 34 cm. aperture, at 7h. 45m. the rings could be seen momentarily, but were totally invisible at 8h. Bands of a brownish tint were several times seen on each side of the trace of the rings.

Dr. Hassenstein made observations with the 13-inch refractor at Königsberg on October 1 and 3. At 8h. (G.M.T.) on the former date the rings were undoubtedly visible, but at 5h. (G.M.T.) on October 3 they were invisible; at 10h. the rings could not be seen, but dark streaks and the shadow of the rings were visible. Dr. Hassenstein concludes that the passage of the earth through the plane of the rings took place at oh. (G.M.T.) on October 3.

**PHOTOGRAPHS OF JUPITER.**—The November number of the *Bulletin de la Société astronomique de France* (p. 481) contains a reproduction from a photograph of Jupiter taken by M. Quénnisset at the Juvisy Observatory on March 2. The instrument employed was the Viennet objective of 0.16 m. (6.3 inches) aperture and 2.9 m. (114 inches) focal length, and about 100 exposures were made. The resulting images show many details, and some of them are remarkably well defined, presenting nearly all the details seen with the 240 mm. equatorial at the same time. On some of the photographs the Great Red Spot is even more apparent than in the visual observation. A reproduction from a drawing made forty minutes earlier shows how well the details are registered on the photograph.

The same journal contains reproductions from Prof. Lowell's photographs of Mars taken on July 11 and 28 respectively.

**FINAL DESIGNATIONS OF RECENTLY DISCOVERED VARIABLES.**—No. 4212 of the *Astronomische Nachrichten* (p. 181, November 7) contains a table giving the final designations of recently discovered variable stars allotted by the commission of the A.G. catalogue for variable stars. The list gives the provisional and final designations, the position for 1900, the precession, the chart place, and the range of magnitude for each variable, and includes twenty-four variable stars of long period, eleven irregular and twenty-five short-period objects, and thirteen variables of the Algol type.

**A LARGE ERUPTIVE PROMINENCE.**—Four excellent photographs of a large eruptive prominence, taken by Mr. Fox on May 21 with the Rumford spectroheliograph of the Yerkes Observatory, are reproduced in No. 3, vol. xxvi., of the *Astrophysical Journal* (October, p. 155). On the first photograph the prominence was seen strongly attached to the sun's limb, but on the succeeding plates it is shown as greatly altered in form and considerably weakened in its lower parts. Thirteen plates were exposed, using the H line, between 4h. 2m. and 5h. 59m., and during that period the height of the prominence, as measured on the photographs, varied as shown in the following table:—

G.M.T.		Height			G.M.T.		Height		
h.	m.	228° 6'	kms.	miles	h.	m.	370° 4'	kms.	miles
4	2	228° 6'	167,800	103,200	5	44	370° 4'	271,900	168,850
5	1	280° 5'	205,800	126,800	5	55	423° 3'	310,700	192,950
5	43	431° 8'	316,900	196,800	5	59	412° 7'	303,000	188,150

**SURVEYS OF NEBULÆ.**—Future workers on the possible changes in nebulae or in the stars involved in such masses will find the exhaustive surveys of the Andromeda, the  $\xi$  Persei, and the 12 Monocerotis nebulae, recently carried

out at the Astrophysical Institute, Königstuhl-Heidelberg, of invaluable assistance.

The results of these surveys are published at length in the *Publikationen* of the institute, No. 1, vol. iii., containing those obtained by Herr P. Gotz from his researches on the Andromeda nebula, and No. 11, vol. ii., embodying Herr Lohnert's results concerning the star-densities of the nebulae near  $\xi$  Persei and 12 Monocerotis respectively. The former treats of 1259 stars involved in the great spiral nebulae, and gives the position and magnitude of each star for the equinox of 1900; then follows a catalogue of fifty-four recognisable points in the nebula which have been measured, and of which the positions (1900) are given. The treatise concludes with a detailed description of the nebula, a discussion of the relation of the star-density to the form and brightness of the gaseous mass in various parts, and the results of a statistical investigation of the distribution of the stars. Among other results, Herr Gotz finds that all the stars concerned are fainter than the ninth, whilst sixty-four are fainter than the sixteenth, magnitude. The greatest number, taken in magnitudes, are between magnitude 14.0 and 15.0, there being 316 of this class.

Herr Lohnert's work deals similarly with the distribution of the stars in the other two nebulae named, the results being given in tables and also shown diagrammatically, as are those appertaining to the Andromeda research.

## NEW GEOLOGICAL SURVEY MAPS AND MEMOIRS.<sup>1</sup>

(1) **THE** Geological Survey is making rapid progress in the publication of its re-survey of Cornwall; the memoir on the geology of Falmouth and Truro (Sheet 352) has already been reviewed in *NATURE*, and that on the Newquay district was described in the issue for May 16. Now we have the Penzance sheet of the map (adjoining that of Falmouth), and an explanation thereof.

This area includes not only the "Land's End district," including Penzance and St. Ives, but also the neck of land which unites it to the rest of Cornwall. The district possesses several interesting physical features, for the granite areas up to a height of about 420 feet above the sea exhibit smooth and undulating contours, the ground forming a dissected plateau and rising gently to the foot of a well-marked bluff, which is an ancient sea-cliff. The age of this plateau cannot be fixed for certain, and though Mr. Reid seems inclined to refer it to early Pliocene time, he admits that it may be much older (? Eocene), and may only have been re-modelled and graded in Pliocene times. The low-lying neck of land which lies between Mounts Bay and St. Ives Bay has also an interesting history; originally it may have been part of an Eocene river-valley, but in Pliocene times it was a strait, and the Land's End district was then an island.

The most important rock-masses delineated on the colour-printed map and described in the memoir are:—(1) the three members of the Lower Palaeozoic system, which are probably of Ordovician age, but have received local names in Cornwall—the Mylor series, the Falmouth series, and the Portscatho series; (2) the masses of intrusive igneous rock—granite and greenstone—which have been thrust through these ancient strata.

The contact-alterations produced by these successive intrusions are fully explained. The greenstones (diabasic rocks) are earlier than the granite, and their effects are different from those produced by the latter. Each area of granite is surrounded by an aureole or belt of altered rock, and the border of the granite itself has been converted into schorl-rock (quartz and tourmaline). It is in these altered belts and in the adjacent parts of the granite that the principal mineral wealth of the country has been found.

There is a chapter on the elvans or dykes of quartz-

<sup>1</sup> (1) "The Geology of the Lands End District." By Clement Reid, F.R.S., and Dr. J. S. Flett, with contributions by Messrs. Wilkinson, Dixon, Pollard, and MacAlister. Pp. viii+158; with six plates. (London: H.M. Stationery Office, 1907.) Price of memoir 3s. 6d., of map 2s. 6d.

(2) "The Geology of the Country around Hungerford and Newbury." By H. J. Osborne White. Pp. iv+150; illustrated. (London: H.M. Stationery Office, 1907.) Price of memoir 2s. 6d., of map 1s. 6d.

porphyry which traverse the district, and are of slightly later date than the granite. Fifty-seven pages are devoted to economic geology and mining, much information being given about the mineral lodes and the mines, some of which are now being re-opened.

Brief accounts are given of the Pliocene deposits of St. Erth and of the later Pleistocene accumulations.

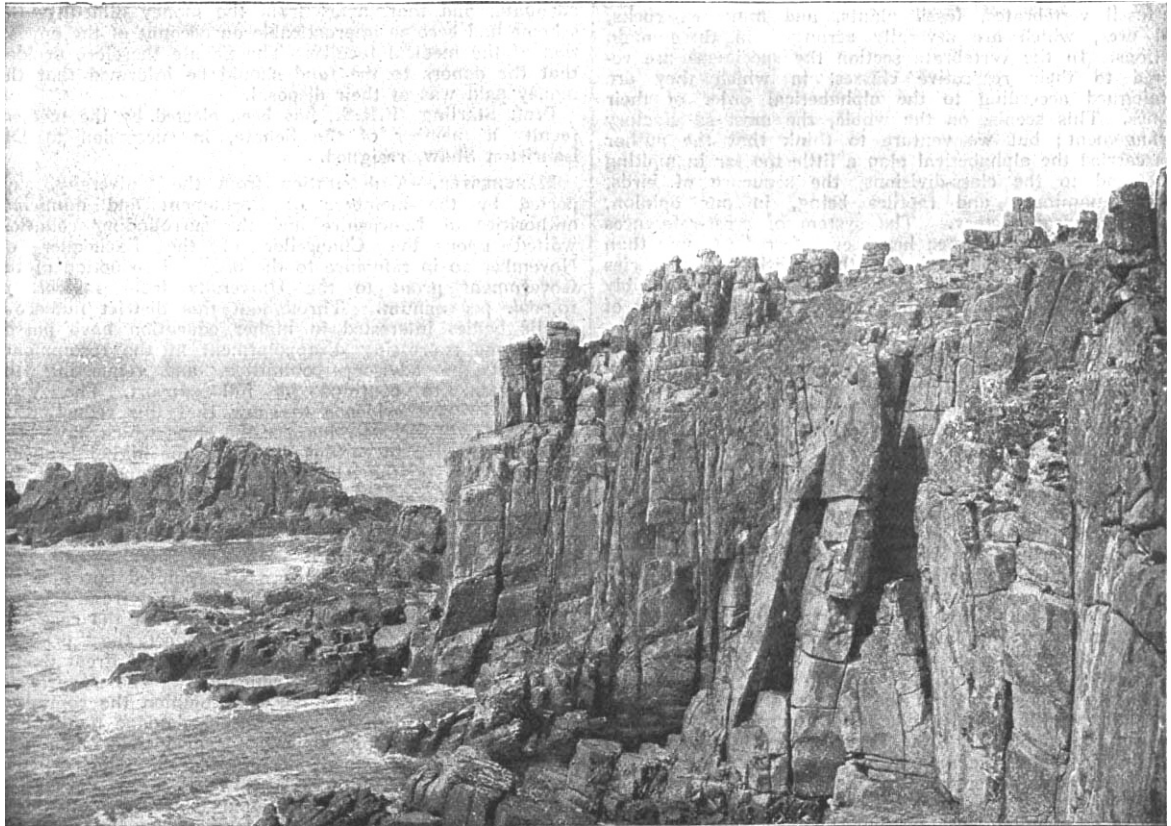
The photographic views are clear and well reproduced, as may be seen from the example here given. The map is well printed on good thick paper, and the only fault we have to find with the colouring is that the tints indicating Pliocene and Valley Gravel are barely distinguishable from one another.

(2) The second memoir deals with an area which includes parts of Berkshire, Wiltshire, and Hampshire, the larger portion being in Berkshire and traversed by the valley of

found in two small outliers, which are due to shallow synclinal flexures.

By aid of this zonal work Mr. White is able to show the exact nature and extent of the unconformity between the Chalk and the Eocene. This proves to be a gradual overstep, the Eocene passing transgressively on to older and older beds in a northerly direction. Hence it would seem that, prior to the Eocene sedimentation, the whole area had a continuous slope from north to south, and that the Kingsclere-Pewsey anticline is entirely of post-Eocene date.

Chapters are devoted to the Reading beds, the London Clay, the Lower Bagshot beds, the Clay-with-Flints, the Plateau Gravel, the valley gravels, alluvium, and economics. There are also appendices on the Mollusca of the alluvium of the Kennet by Messrs. A. S. Kennard and B. B. Woodward, and on the insoluble matter in



View of the south side of the Land's End. From "The Geology of the Land's End District."

the Kennet. Nothing older than the Selbornian (Upper Greensand) reaches the surface, and the greater part is occupied by Chalk, Eocene beds, and Clay-with-flints. The colouring of the map is clear, and the paper on which it is printed is thicker than that of sheets issued in previous years.

It is some time since this area was surveyed, and in the meantime Mr. Osborne White has made a detailed study of the Chalk and its zones in Berkshire, as well as of the superficial deposits of this and neighbouring districts, so that the preparation of the memoir could not have been put into better hands.

Of the Cretaceous rocks described, the chief interest centres in the Upper Chalk, which is dealt with zone by zone; two of these, the zone of *Marsupites testudinarius* and that of *Actinocamax quadratus*, have only been proved to exist in Berkshire within the last three years. The former has a continuous outcrop from the western border as far east as Newbury, and this outcrop is indicated on a sketch-map in the memoir; but the higher zone is only

samples of Upper Chalk by Dr. W. Pollard and Mr. H. H. Thomas. Finally, the memoir is furnished with a bibliography and a good index.

#### RECENT PUBLICATIONS OF THE U.S. MUSEUM.<sup>1</sup>

THE subjoined list (which is exclusive of a large number of minor publications) affords a striking example of the energy with which scientific research is being pushed in America, a noteworthy fact being that,

- (1) "The Birds of North and Middle America." Part iv. By R. Ridgway. Bull. U.S. Nat. Museum, No. 50. Pp. xxii+973.
- (2) "Catalogue of the Type and Figured Specimens of Fossils, Minerals, Rocks, and Ores in the Department of Geology, U.S. Mus." Part ii. By J. P. Merrill. *Op. cit.*, No. 53. Pp. v+379.
- (3) "The Families and Genera of Bats." By G. S. Miller. *Op. cit.* No. 57. Pp. xvii+282.
- (4) "Herpetology of Japan and Adjacent Territory." By L. Stejneger. *Op. cit.*, No. 58. Pp. xx+577.
- (5) "Report on the Diatoms of the *Albatross* Voyages in the Pacific Ocean, 1888-1904." By Albert Mann. Contr. U.S. Nat. Herbarium, vol. x., part v. Pp. v+221-424.